Tidal and Lunar Data for Point Mugu and San Nicolas Island During 1996

by
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and
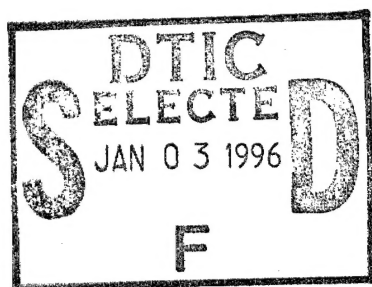Bernard Cohenour
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NAVAL AIR WARFARE CENTER WEAPONS DIVISION

FOREWORD

This publication comprises a single source for all tidal and lunar data for operational locations of the Naval Air Warfare Center Weapons Division for use in Calendar Year 1996.

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Basic lunar and tidal data for Point Mugu and San Nicolas Island during 1996 are provided. The data presented are: (1) Tidal data; (2) times of moonrise and moonset; (3) times of lunar phases; and (4) times of sunrise and sunset.

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INTRODUCTION

This publication combines a single source for all tidal and lunar data for operational locations of the Naval Air Warfare Center Weapons Division for use in Calendar Year 1996.

The data presentations are for Point Mugu and San Nicolas Island. Within each division, the times of moonrise/moonset and tidal data are given. Appendixes provide information on lunar phases, sunrise and sunset times and calculation of the tide at any time. This publication is issued annually. Information regarding this data may be obtained from the Geophysics Branch of the Pacific Ranges and Facilities Department.

Special tidal data requests (ranges, heights at any time, and/or graphical depictions of each) for Point Mugu and San Nicolas Island, or other locations can be made by contacting the authors of this report at the Naval Air Warfare Center Weapons Division (805) 989-8383.

DATA SOURCE AND TIME REFERENCES

The data given here have been prepared using the tides module of the oceanographic section of the Geophysical Fleet Mission Programs Library (GFMPL) and the Astronomical Almanac, published by the U. S. Naval Observatory. The GFMPL is used throughout the navy's meteorological and oceanographic community to support the fleet's EM/EO and environmental needs and concerns.

For Point Mugu and San Nicolas Island, all times listed are Pacific Standard Time (PST), add eight hours to obtain Universal Coordinated Time (UCT or Z). When Daylight Savings Time (PDT) is in effect, one hour is to be added to the times given. In 1996, Pacific Daylight Time is scheduled to commence at 0200 PST on Sunday, 7 April, and to end at 0200 PDT on Sunday, 27 October.

TIDAL DATA

The ranges of tidal heights that may be expected at Point Mugu and San Nicolas Island are shown in Table 1. The times and height of high and low tides for 1996 at Point Mugu are given in Tables 3 through 14, and at San Nicolas Island in Tables 15 through 26.

TABLE 1. Tidal Ranges for Point Mugu and San Nicolas Island.

Point Mugu		
Tidal Levels	**Height (Ft)**	**Occurrence**
Extreme high water	6.74	2012, Jul 29
Mean tide level (mean sea level)	2.7	
Extreme low water	-1.61	1542, Jan 20
Tidal Ranges	**Height (Ft)**	**Occurrence(s)**
Maximum	8.33	Jan 20
Minimum	2.09	Oct 06
San Nicolas Island		
Tidal Levels	**Height (Ft)**	**Occurrence**
Extreme high water	6.23	2018, Jul 29
Mean tide level (mean sea level)	2.5	
Extreme low water	-1.48	1554, Jan 20
Tidal Ranges	**Height (Ft)**	**Occurrence(s)**
Maximum	7.64	Jan 20
Minimum	1.91	Oct 06

These tables list the times and heights of high and low tide for each month of the year and chronologically through each day. The heights are all measured from mean lower low water and are values for a sea unaffected by wind waves or swell. The height and character of the sea surface are influenced by factors other than the predictable positions of the moon and sun, and thus are likely to be higher or lower than computed values indicate.

LUNAR DATA

Times of moonrise and moonset for the Point Mugu-San Nicolas Island area in 1996 are given in Table 2, preceding the tidal data for the respective stations. Information regarding the phases of the moon in 1996 is found in Appendix B.

TABLE 2. Moonrise and Moonset, Point Mugu, 1996.

Location: W119 07', N34 07'

Point Mugu, California
Rise and Set for the Moon for 1996

Pacific Standard Time

Astronomical Applications Dept.
U.S. Naval Observatory
Washington, D.C. 20392-5420

	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
Day	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
01	1411	0322	1515	0436	1453	0356	1624	0417	1707	0359	1905	0447	1944	0532	2037	0746	2109	0946	2113	1028	2225	1133	2253	1124
02	1454	0415	1607	0519	1547	0434	1722	0451	1810	0438	2006	0545	2035	0641	2116	0853	2151	1047	2201	1121	2317	1213	2347	1157
03	1540	0506	1700	0558	1642	0510	1821	0527	1914	0520	2104	0647	2121	0750	2155	0958	2234	1145	2251	1211		1250		1230
04	1628	0553	1754	0635	1738	0545	1923	0604	2018	0608	2156	0753	2202	0858	2233	1100	2320	1239	2342	1256	0010	1325	0041	1302
05	1719	0638	1849	0711	1835	0619	2025	0644	2120	0701	2242	0900	2241	1005	2313	1200		1330		1338	0104	1358	0136	1336
06	1812	0720	1945	0744	1932	0653	2128	0727	2218	0759	2324	1007	2318	1108	2354	1258	0008	1417	0034	1416	0158	1431	0233	1411
07	1905	0758	2041	0818	2032	0728	2229	0816	2312	0901		1112	2356	1210		1353	0058	1500	0127	1452	0253	1504	0332	1450
08	1959	0834	2139	0851	2132	0805	2328	0909		1006	0003	1215		1310	0038	1445	0149	1540	0220	1526	0350	1539	0433	1534
09	2054	0908	2238	0926	2233	0846		1007	0000	1111	0040	1317	0033	1408	0124	1534	0242	1618	0314	1559	0449	1617	0535	1623
10	2150	0942	2338	1004	2335	0930	0023	1109	0043	1215	0117	1417	0113	1504	0212	1620	0335	1653	0409	1633	0549	1658	0638	1718
11	2246	1014		1045		1019	0114	1213	0123	1319	0153	1515	0155	1558	0303	1702	0428	1727	0505	1707	0651	1744	0738	1819
12	2345	1048	0040	1131	0035	1113	0200	1318	0201	1421	0232	1613	0239	1649	0354	1741	0523	1800	0603	1743	0752	1836	0835	1923
13		1124	0142	1223	0133	1213	0242	1422	0238	1522	0312	1709	0326	1737	0447	1818	0618	1833	0701	1821	0852	1932	0927	2030
14	0045	1204	0243	1321	0227	1316	0322	1526	0314	1623	0355	1802	0415	1822	0540	1852	0714	1907	0801	1904	0949	2032	1014	2137
15	0148	1248	0341	1424	0317	1422	0400	1630	0352	1722	0441	1853	0506	1903	0634	1925	0811	1943	0901	1951	1042	2136	1056	2242
16	0252	1338	0436	1531	0403	1529	0438	1732	0432	1820	0529	1940	0559	1941	0728	1958	0909	2022	1001	2042	1130	2240	1136	2347
17	0356	1435	0526	1640	0445	1635	0516	1833	0514	1915	0619	2023	0652	2016	0823	2031	1008	2105	1059	2139	1214	2345	1214	
18	0459	1538	0611	1749	0526	1741	0555	1932	0558	2008	0711	2103	0745	2050	0919	2105	1107	2153	1153	2239	1255		1252	0050
19	0557	1646	0654	1856	0604	1845	0636	2030	0645	2057	0804	2139	0839	2122	1016	2142	1206	2246	1244	2342	1334	0049	1334	0151
20	0651	1756	0733	2001	0643	1947	0719	2125	0735	2143	0857	2214	0933	2155	1114	2222	1303	2344	1330		1412	0153	1410	0252
21	0739	1905	0812	2104	0721	2048	0805	2216	0826	2225	0950	2247	1028	2228	1214	2307	1357		1414	0047	1450	0256	1451	0351
22	0822	2013	0849	2205	0801	2147	0853	2303	0918	2303	1044	2320	1124	2303	1314	2357	1447	0047	1455	0153	1530	0358	1536	0449
23	0902	2118	0928	2304	0843	2242	0943	2347	1011	2339	1140	2353	1223	2341	1414		1534	0153	1534	0258	1611	0500	1624	0544
24	0940	2221	1008		0927	2335	1035		1104		1236		1323		1512	0054	1618	0300	1614	0404	1655	0600	1714	0635
25	1017	2321	1049	0000	1013		1127	0027	1159	0013	1335	0027	1425	0024	1606	0156	1700	0408	1653	0508	1742	0658	1805	0723
26	1053		1134	0054	1102	0024	1221	0105	1254	0046	1436	0105	1527	0113	1657	0302	1740	0515	1734	0612	1831	0752	1858	0807
27	1131	0019	1220	0144	1152	0110	1315	0140	1351	0120	1539	0146	1629	0208	1744	0412	1820	0622	1818	0714	1922	0842	1951	0847
28	1211	0115	1309	0231	1244	0152	1410	0214	1450	0154	1644	0233	1727	0310	1828	0521	1901	0727	1903	0813	2014	0928	2045	0923
29	1253	0209	1400	0315	1337	0231	1507	0248	1551	0231	1747	0327	1821	0416	1909	0631	1943	0830	1951	0910	2107	1010	2138	0958
30	1337	0301			1431	0308	1606	0323	1655	0311	1848	0427	1910	0526	1949	0738	2027	0931	2041	1002	2200	1048	2231	1030
31	1425	0350			1527	0343			1800	0356			1955	0637	2029	0843			2132	1050			2325	1102

Add one hour for daylight time, if and when in use.

TABLE 3. Point Mugu Tides, January 1996.

TABLE 4. Point Mugu Tides, February 1996.

January 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 60.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.49			0618	5.41	1336	-0.08	1948	3.44
02	5.89	0036	2.00	0648	5.56	1412	-0.34	2024	3.56
03	6.16	0118	2.01	0718	5.66	1442	-0.50	2054	3.66
04	6.31	0148	1.99	0748	5.72	1512	-0.59	2124	3.73
05	6.33	0224	1.96	0824	5.72	1542	-0.60	2154	3.79
06	6.19	0254	1.94	0854	5.64	1606	-0.54	2230	3.83
07	5.88	0330	1.95	0924	5.47	1636	-0.41	2254	3.87
08	5.38	0406	2.00	0954	5.19	1706	-0.19	2330	3.90
09	4.72	0442	2.07	1030	4.82	1736	0.10		
10	3.91	0006	3.95	0530	2.15	1106	4.35	1806	0.44
11	3.17	0054	3.96	0630	2.26	1148	3.86	1848	0.79
12	2.92	0136	4.08	0754	2.19	1248	3.31	1930	1.17
13	2.78	0230	4.30	0930	1.86	1430	2.88	2024	1.51
14	3.35	0324	4.62	1054	1.26	1630	2.80	2136	1.76
15	4.51	0424	5.04	1154	0.53	1754	3.04	2248	1.84
16	5.73	0524	5.53	1248	-0.20	1854	3.38	2354	1.76
17	6.85	0612	6.01	1336	-0.83	1948	3.73		
18	7.74	0048	1.59	0654	6.42	1418	-1.31	2030	4.05
19	8.26	0136	1.38	0748	6.68	1454	-1.58	2112	4.31
20	8.33	0230	1.19	0836	6.72	1542	-1.61	2154	4.51
21	7.92	0318	1.07	0918	6.51	1618	-1.41	2230	4.64
22	7.07	0406	1.05	1000	6.06	1654	-1.01	2318	4.69
23	5.87	0454	1.14	1048	5.41	1742	-0.47	2400	4.68
24	4.47	0554	1.29	1142	4.63	1824	0.17		
25	3.82	0054	4.63	0712	1.44	1248	3.84	1912	0.81
26	3.17	0154	4.58	0842	1.46	1412	3.18	2006	1.40
27	3.33	0254	4.56	1018	1.24	1606	2.86	2112	1.86
28	3.80	0406	4.64	1142	0.83	1754	2.94	2230	2.10
29	4.37	0506	4.79	1236	0.42	1854	3.16	2336	2.15
30	4.91	0554	4.98	1318	0.07	1942	3.38		
31	5.31	0030	2.08	0636	5.17	1354	-0.19	2006	3.56

February 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.71	0106	1.96	0712	5.34	1424	-0.37	2036	3.71
02	5.94	0142	1.81	0736	5.46	1448	-0.48	2100	3.85
03	6.03	0212	1.66	0806	5.51	1518	-0.52	2124	3.97
04	5.95	0248	1.53	0836	5.47	1542	-0.47	2148	4.08
05	5.68	0318	1.45	0912	5.33	1606	-0.35	2224	4.17
06	5.22	0354	1.41	0948	5.08	1636	-0.13	2248	4.23
07	4.57	0430	1.41	1018	4.73	1654	0.16	2318	4.29
08	3.81	0512	1.44	1054	4.27	1730	0.52	2354	4.33
09	2.80	0606	1.49	1142	3.73	1754	0.93		
10	3.00	0036	4.37	0712	1.51	1242	3.16	1836	1.36
11	3.08	0130	4.43	0848	1.36	1418	2.72	1930	1.78
12	3.65	0230	4.57	1024	0.92	1630	2.70	2054	2.07
13	4.55	0348	4.86	1136	0.30	1754	3.03	2236	2.07
14	5.58	0454	5.27	1230	-0.32	1848	3.45	2348	1.82
15	6.54	0554	5.71	1318	-0.83	1936	3.87		
16	7.26	0042	1.45	0654	6.08	1354	-1.18	2012	4.26
17	7.61	0136	1.04	0742	6.29	1436	-1.32	2048	4.59
18	7.53	0224	0.70	0830	6.28	1518	-1.25	2124	4.83
19	7.02	0312	0.46	0912	6.04	1554	-0.98	2206	4.98
20	6.13	0354	0.37	0954	5.59	1630	-0.54	2242	5.00
21	4.97	0448	0.43	1036	4.98	1706	0.01	2312	4.92
22	4.12	0536	0.62	1124	4.27	1742	0.62	2354	4.74
23	2.71	0636	0.86	1224	3.57	1824	1.23		
24	3.43	0042	4.50	0754	1.07	1342	2.98	1906	1.79
25	3.19	0142	4.28	0930	1.10	1554	2.73	2018	2.23
26	3.30	0306	4.17	1054	0.87	1748	2.90	2206	2.41
27	3.69	0424	4.24	1206	0.55	1842	3.19	2324	2.30
28	4.19	0524	4.43	1248	0.25	1918	3.44		
29	4.66	0018	2.07	0612	4.67	1324	0.01	1942	3.66

TABLE 5. Point Mugu Tides, March 1996.

March 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.04	0054	1.79	0654	4.88	1348	-0.15	2000	3.87
02	5.29	0130	1.50	0718	5.04	1418	-0.25	2024	4.07
03	5.39	0154	1.22	0754	5.13	1442	-0.27	2042	4.27
04	5.33	0236	0.98	0824	5.12	1506	-0.21	2106	4.45
05	5.07	0306	0.78	0854	5.00	1530	-0.07	2136	4.59
06	4.62	0342	0.64	0936	4.77	1554	0.16	2206	4.70
07	4.29	0418	0.56	1012	4.44	1624	0.46	2236	4.76
08	4.19	0454	0.56	1054	4.00	1654	0.83	2306	4.75
09	4.07	0548	0.63	1142	3.51	1724	1.25	2348	4.70
10	2.31	0654	0.71	1254	3.02	1806	1.69		
11	3.89	0042	4.59	0818	0.70	1436	2.75	1912	2.09
12	4.05	0154	4.52	0954	0.48	1630	2.90	2054	2.29
13	4.54	0318	4.61	1106	0.08	1742	3.30	2236	2.10
14	5.21	0442	4.88	1206	-0.33	1830	3.75	2348	1.64
15	5.85	0542	5.21	1254	-0.64	1912	4.20		
16	6.27	0048	1.10	0648	5.48	1336	-0.79	1948	4.60
17	6.37	0136	0.58	0736	5.60	1412	-0.77	2018	4.94
18	6.13	0218	0.16	0818	5.54	1448	-0.60	2054	5.17
19	5.58	0254	-0.12	0906	5.30	1524	-0.28	2124	5.28
20	5.48	0348	-0.23	0948	4.91	1554	0.14	2154	5.25
21	5.27	0430	-0.17	1024	4.42	1630	0.62	2230	5.10
22	4.81	0518	0.03	1112	3.88	1654	1.14	2306	4.83
23	4.19	0606	0.31	1206	3.36	1736	1.65	2342	4.50
24	2.33	0706	0.61	1324	2.94	1818	2.11		
25	3.34	0036	4.16	0824	0.82	1530	2.80	1924	2.48
26	3.05	0154	3.87	0954	0.82	1718	3.00	2130	2.59
27	3.11	0324	3.77	1106	0.66	1806	3.29	2306	2.37
28	3.42	0442	3.89	1154	0.47	1836	3.56	2354	2.01
29	3.79	0542	4.09	1236	0.31	1854	3.83		
30	4.11	0036	1.61	0624	4.30	1306	0.20	1924	4.10
31	4.27	0112	1.19	0706	4.47	1336	0.15	1936	4.38

TABLE 6. Point Mugu Tides, April 1996.

April 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.49	0148	0.79	0736	4.57	1354	0.16	2000	4.65
02	4.66	0218	0.42	0806	4.59	1424	0.23	2024	4.89
03	4.98	0254	0.11	0842	4.52	1454	0.38	2054	5.09
04	5.35	0330	-0.13	0924	4.35	1524	0.61	2118	5.23
05	5.53	0406	-0.26	1012	4.09	1554	0.90	2154	5.27
06	5.49	0454	-0.28	1054	3.75	1624	1.25	2236	5.20
07	5.23	0542	-0.20	1154	3.38	1706	1.63	2324	5.03
08	3.16	0642	-0.06	1312	3.11	1754	2.02		
09	4.70	0018	4.76	0754	0.06	1454	3.07	1918	2.32
10	4.44	0136	4.49	0924	0.05	1618	3.33	2112	2.31
11	4.43	0306	4.37	1036	-0.06	1712	3.75	2242	1.92
12	4.63	0424	4.44	1130	-0.19	1800	4.19	2354	1.33
13	4.86	0536	4.60	1218	-0.24	1836	4.62		
14	5.19	0042	0.71	0630	4.72	1254	-0.19	1912	5.00
15	5.32	0130	0.16	0724	4.76	1342	-0.03	1948	5.29
16	5.72	0212	-0.25	0812	4.67	1412	0.21	2018	5.47
17	6.03	0254	-0.51	0854	4.49	1448	0.51	2054	5.52
18	6.05	0336	-0.61	0942	4.23	1518	0.87	2124	5.44
19	5.80	0412	-0.55	1024	3.91	1554	1.25	2154	5.25
20	5.34	0454	-0.38	1112	3.58	1624	1.63	2230	4.97
21	4.74	0542	-0.11	1200	3.28	1654	2.01	2300	4.62
22	4.06	0630	0.18	1312	3.06	1742	2.35	2342	4.24
23	2.56	0730	0.45	1442	3.01	1848	2.63		
24	3.23	0036	3.86	0842	0.63	1606	3.18	2042	2.71
25	2.88	0200	3.57	0954	0.69	1706	3.44	2230	2.45
26	3.06	0336	3.48	1048	0.67	1742	3.74	2330	2.02
27	3.41	0454	3.55	1130	0.64	1806	4.05		
28	3.75	0012	1.52	0548	3.70	1206	0.62	1830	4.38
29	4.09	0048	1.00	0636	3.85	1242	0.63	1854	4.72
30	4.58	0124	0.49	0718	3.97	1312	0.68	1924	5.07

TABLE 7. Point Mugu Tides, May 1996.

May 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.38	0154	0.00	0754	4.05	1342	0.77	1948	5.38
02	6.06	0236	-0.42	0836	4.06	1412	0.90	2018	5.63
03	6.53	0318	-0.75	0918	3.99	1448	1.09	2048	5.78
04	6.73	0354	-0.93	1006	3.86	1524	1.32	2130	5.80
05	6.63	0448	-0.97	1106	3.69	1606	1.60	2218	5.66
06	6.23	0536	-0.87	1206	3.53	1654	1.91	2306	5.36
07	4.13	0636	-0.66			1318	3.47	1754	2.19
08	5.36	0006	4.95	0742	-0.42	1436	3.58	1930	2.32
09	4.69	0118	4.50	0848	-0.19	1548	3.87	2112	2.15
10	4.26	0248	4.15	0954	-0.01	1642	4.25	2242	1.66
11	4.50	0412	4.00	1054	0.16	1724	4.66	2348	1.04
12	4.70	0524	3.98	1142	0.33	1800	5.04		
13	4.90	0042	0.44	0624	4.00	1224	0.54	1836	5.34
14	5.62	0130	-0.06	0718	4.00	1306	0.76	1912	5.55
15	6.09	0212	-0.43	0806	3.96	1342	1.01	1948	5.66
16	6.32	0248	-0.65	0854	3.88	1418	1.25	2024	5.67
17	6.31	0324	-0.73	0942	3.77	1448	1.50	2054	5.58
18	6.10	0354	-0.69	1024	3.64	1524	1.75	2124	5.41
19	5.72	0442	-0.56	1106	3.50	1554	2.00	2154	5.16
20	5.20	0518	-0.35	1154	3.38	1630	2.24	2230	4.84
21	4.58	0554	-0.10	1242	3.30	1718	2.48	2306	4.47
22	3.90	0648	0.17	1348	3.31	1818	2.67	2348	4.07
23	3.00	0736	0.44	1454	3.44	1948	2.73		
24	3.00	0048	3.66	0830	0.66	1548	3.66	2130	2.53
25	3.10	0212	3.34	0924	0.84	1636	3.94	2248	2.10
26	3.31	0348	3.20	1018	0.97	1706	4.28	2342	1.56
27	3.59	0506	3.22	1054	1.07	1736	4.66		
28	4.11	0024	0.95	0606	3.34	1142	1.15	1812	5.07
29	5.14	0106	0.34	0654	3.50	1224	1.22	1842	5.48
30	6.10	0142	-0.24	0748	3.66	1254	1.28	1918	5.85
31	6.84	0224	-0.75	0830	3.78	1342	1.36	1948	6.14

TABLE 8. Point Mugu Tides, June 1996.

June 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	7.44	0306	-1.13	0918	3.86	1424	1.46	2030	6.31
02	7.64	0348	-1.35	1006	3.90	1512	1.58	2112	6.29
03	7.47	0436	-1.38	1054	3.91	1554	1.74	2200	6.09
04	6.93	0524	-1.24	1154	3.93	1654	1.92	2248	5.69
05	6.08	0618	-0.95	1254	4.00	1806	2.08	2354	5.14
06	4.70	0712	-0.56			1354	4.15	1924	2.11
07	4.64	0106	4.52	0812	-0.12	1454	4.39	2054	1.91
08	4.39	0224	3.97	0912	0.30	1554	4.70	2230	1.47
09	4.33	0354	3.62	1012	0.68	1654	5.01	2336	0.91
10	4.30	0518	3.49	1106	1.00	1736	5.30		
11	5.15	0036	0.37	0630	3.50	1154	1.27	1812	5.52
12	5.74	0124	-0.07	0718	3.55	1236	1.49	1848	5.67
13	6.12	0206	-0.37	0806	3.61	1318	1.66	1924	5.74
14	6.31	0242	-0.56	0854	3.64	1354	1.80	1954	5.75
15	6.33	0318	-0.63	0936	3.65	1424	1.92	2030	5.69
16	6.19	0348	-0.62	1012	3.65	1454	2.03	2106	5.57
17	5.91	0424	-0.54	1048	3.65	1536	2.15	2136	5.37
18	5.48	0454	-0.38	1130	3.64	1612	2.28	2206	5.10
19	4.92	0530	-0.17	1212	3.64	1654	2.41	2242	4.75
20	4.24	0606	0.10	1254	3.68	1748	2.54	2324	4.34
21	3.36	0642	0.40	1336	3.77	1854	2.60		
22	3.20	0006	3.88	0724	0.72	1424	3.93	2024	2.50
23	3.13	0106	3.42	0812	1.04	1512	4.17	2154	2.16
24	3.18	0236	3.07	0854	1.31	1600	4.49	2306	1.62
25	3.90	0418	2.95	0954	1.52	1648	4.88	2354	0.98
26	3.67	0542	3.06	1048	1.66	1730	5.32		
27	5.47	0042	0.31	0648	3.29	1142	1.71	1812	5.78
28	6.53	0130	-0.33	0736	3.54	1230	1.70	1854	6.20
29	7.39	0212	-0.87	0824	3.79	1324	1.65	1936	6.52
30	7.95	0254	-1.26	0912	4.01	1412	1.59	2024	6.69

TABLE 9. Point Mugu Tides, July 1996.

July 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	8.11	0336	-1.46	0948	4.19	1454	1.56	2100	6.64
02	7.82	0418	-1.45	1036	4.33	1554	1.58	2148	6.37
03	7.11	0506	-1.23	1124	4.45	1648	1.64	2242	5.88
04	6.04	0554	-0.83	1218	4.55	1754	1.72	2336	5.22
05	4.96	0642	-0.30	1318	4.65	1906	1.77		
06	4.50	0048	4.48	0730	0.28	1418	4.78	2036	1.67
07	4.09	0206	3.81	0824	0.85	1518	4.94	2206	1.37
08	4.21	0342	3.37	0930	1.33	1612	5.13	2324	0.92
09	3.63	0512	3.25	1030	1.69	1706	5.31		
10	5.01	0024	0.47	0630	3.34	1130	1.91	1754	5.48
11	5.52	0112	0.10	0730	3.48	1218	2.02	1830	5.61
12	5.87	0154	-0.16	0806	3.62	1254	2.06	1906	5.71
13	6.08	0230	-0.32	0842	3.73	1336	2.06	1942	5.75
14	6.15	0254	-0.40	0912	3.82	1412	2.04	2012	5.75
15	6.08	0330	-0.41	0948	3.89	1448	2.03	2048	5.67
16	5.86	0354	-0.34	1018	3.96	1524	2.03	2118	5.52
17	5.48	0424	-0.21	1048	4.01	1554	2.06	2154	5.27
18	4.93	0454	0.00	1124	4.06	1636	2.12	2224	4.93
19	4.24	0524	0.27	1154	4.10	1718	2.19	2254	4.51
20	3.56	0554	0.60	1230	4.16	1812	2.25	2342	4.03
21	3.29	0624	0.97	1306	4.26	1924	2.23		
22	3.06	0030	3.51	0706	1.34	1354	4.41	2054	2.03
23	3.06	0154	3.06	0754	1.70	1454	4.65	2224	1.58
24	4.02	0348	2.89	0854	1.99	1554	4.99	2330	0.96
25	3.29	0530	3.04	1012	2.13	1654	5.42		
26	5.59	0024	0.30	0636	3.36	1118	2.09	1748	5.89
27	6.64	0112	-0.32	0724	3.71	1218	1.92	1836	6.32
28	7.47	0154	-0.82	0812	4.06	1312	1.68	1924	6.65
29	7.94	0236	-1.15	0848	4.38	1354	1.43	2012	6.79
30	7.97	0318	-1.27	0930	4.65	1454	1.23	2054	6.70
31	7.49	0354	-1.16	1006	4.86	1542	1.12	2142	6.36

TABLE 10. Point Mugu Tides, August 1996.

August 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	6.65	0436	-0.84	1048	5.00	1636	1.12	2230	5.81
02	5.45	0518	-0.35	1136	5.05	1736	1.21	2324	5.10
03	4.79	0554	0.25	1224	5.04	1842	1.34		
04	4.10	0024	4.33	0648	0.89	1318	4.99	2006	1.42
05	3.64	0142	3.66	0742	1.50	1424	4.94	2136	1.31
06	3.95	0330	3.26	0848	1.99	1530	4.96	2254	1.01
07	2.78	0518	3.25	1006	2.28	1636	5.06		
08	4.57	0006	0.65	0630	3.45	1118	2.36	1730	5.22
09	5.04	0054	0.34	0718	3.67	1212	2.30	1818	5.38
10	5.41	0136	0.12	0754	3.85	1254	2.18	1854	5.52
11	5.64	0206	-0.02	0818	4.01	1330	2.02	1924	5.62
12	5.74	0236	-0.09	0842	4.14	1406	1.87	2000	5.65
13	5.70	0254	-0.09	0906	4.27	1436	1.74	2030	5.61
14	5.49	0324	-0.02	0930	4.38	1506	1.64	2100	5.47
15	5.11	0354	0.13	1006	4.48	1542	1.59	2136	5.23
16	4.56	0418	0.34	1030	4.55	1618	1.59	2206	4.90
17	3.96	0442	0.63	1054	4.59	1654	1.62	2242	4.48
18	3.64	0512	0.98	1130	4.62	1748	1.68	2324	4.00
19	3.28	0536	1.36	1206	4.64	1848	1.72		
20	3.01	0024	3.49	0612	1.76	1254	4.67	2012	1.65
21	3.40	0154	3.07	0654	2.15	1354	4.75	2148	1.35
22	4.13	0354	2.99	0818	2.45	1512	4.96	2306	0.83
23	5.06	0524	3.27	0954	2.50	1624	5.32	2354	0.26
24	3.48	0618	3.67	1118	2.27	1724	5.75		
25	6.40	0048	-0.25	0700	4.09	1218	1.88	1824	6.15
26	7.05	0130	-0.62	0742	4.51	1306	1.43	1912	6.43
27	7.32	0212	-0.81	0824	4.89	1354	1.02	1954	6.51
28	7.16	0248	-0.80	0854	5.20	1448	0.69	2048	6.36
29	6.57	0324	-0.58	0936	5.41	1536	0.52	2136	5.99
30	5.69	0406	-0.19	1012	5.50	1624	0.50	2224	5.44
31	5.09	0442	0.33	1048	5.46	1718	0.64	2312	4.78

TABLE 11. Point Mugu Tides, September 1996.

September 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.43	0524	0.93	1130	5.30	1818	0.87		
02	3.96	0006	4.10	0606	1.54	1218	5.06	1930	1.10
03	3.60	0130	3.54	0654	2.11	1318	4.80	2054	1.19
04	3.56	0318	3.28	0806	2.54	1436	4.63	2224	1.07
05	3.81	0506	3.41	0948	2.71	1554	4.64	2336	0.83
06	2.18	0618	3.68	1112	2.60	1706	4.78		
07	4.38	0024	0.59	0654	3.93	1206	2.35	1754	4.97
08	4.73	0054	0.42	0724	4.14	1248	2.07	1836	5.15
09	4.96	0130	0.32	0748	4.33	1318	1.78	1912	5.27
10	5.05	0154	0.28	0812	4.52	1348	1.51	1948	5.33
11	4.99	0224	0.30	0824	4.70	1424	1.26	2012	5.30
12	4.78	0248	0.39	0848	4.86	1454	1.07	2042	5.17
13	4.44	0312	0.55	0912	4.99	1524	0.94	2118	4.96
14	4.31	0336	0.78	0936	5.08	1554	0.88	2154	4.65
15	4.24	0354	1.07	1012	5.12	1642	0.88	2236	4.27
16	4.16	0430	1.41	1042	5.11	1724	0.95	2324	3.84
17	3.99	0454	1.79	1118	5.04	1824	1.04		
18	3.84	0030	3.41	0536	2.18	1206	4.92	1942	1.08
19	3.88	0206	3.16	0630	2.56	1318	4.81	2112	0.93
20	4.23	0406	3.28	0818	2.79	1442	4.83	2230	0.60
21	4.82	0518	3.65	1006	2.63	1600	5.04	2330	0.22
22	3.19	0600	4.10	1118	2.17	1712	5.37		
23	5.76	0018	-0.09	0636	4.57	1218	1.59	1806	5.67
24	6.11	0054	-0.27	0712	5.01	1306	0.99	1900	5.84
25	6.14	0142	-0.29	0742	5.41	1354	0.48	1954	5.85
26	5.86	0218	-0.15	0284	5.70	1436	0.11	2042	5.67
27	5.94	0254	0.13	0854	5.87	1524	-0.00	2124	5.33
28	5.95	0330	0.54	0936	5.88	1612	-0.07	2212	4.88
29	5.64	0406	1.02	1012	5.74	1654	0.10	2306	4.36
30	5.07	0442	1.54	1048	5.46	1748	0.39		

TABLE 12. Point Mugu Tides, October 1996.

October 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.38	0006	3.86	0518	2.06	1124	5.09	1848	0.71
02	3.73	0118	3.48	0606	2.54	1218	4.69	2006	0.96
03	3.31	0306	3.37	0724	2.90	1330	4.34	2130	1.03
04	3.23	0442	3.57	0930	2.70	1500	4.18	2242	0.95
05	3.41	0536	3.85	1054	2.70	1630	4.24	2336	0.82
06	2.09	0618	4.12	1148	2.31	1724	4.40		
07	3.84	0012	0.73	0642	4.37	1230	1.90	1812	4.57
08	4.02	0048	0.68	0706	4.62	1306	1.49	1854	4.70
09	4.19	0112	0.68	0724	4.87	1336	1.10	1930	4.77
10	4.39	0142	0.73	0748	5.11	1406	0.75	1954	4.77
11	4.87	0206	0.83	0812	5.33	1436	0.46	2030	4.69
12	5.26	0230	0.98	0830	5.50	1512	0.24	2106	4.54
13	5.50	0254	1.20	0900	5.61	1548	0.12	2148	4.31
14	5.56	0324	1.46	0930	5.64	1630	0.09	2230	4.02
15	5.43	0354	1.77	1006	5.58	1718	0.15	2330	3.71
16	5.13	0430	2.12	1048	5.41	1812	0.28		
17	4.74	0042	3.46	0518	2.48	1136	5.15	1924	0.41
18	4.40	0218	3.42	0630	2.79	1248	4.84	2042	0.45
19	4.26	0348	3.66	0830	2.85	1418	4.63	2154	0.37
20	4.38	0448	4.07	1012	2.48	1548	4.64	2254	0.26
21	4.59	0536	4.54	1124	1.86	1700	4.78	2348	0.20
22	3.84	0606	5.01	1218	1.17	1800	4.94		
23	5.23	0030	0.22	0642	5.45	1306	0.53	1854	5.02
24	5.80	0112	0.34	0712	5.81	1348	0.01	1942	4.99
25	6.39	0148	0.55	0748	6.05	1430	-0.34	2036	4.85
26	6.65	0224	0.84	0830	6.14	1512	-0.50	2124	4.62
27	6.57	0254	1.19	0854	6.09	1554	-0.48	2206	4.32
28	6.20	0330	1.56	0936	5.89	1642	-0.31	2254	4.00
29	5.60	0406	1.96	1012	5.57	1724	-0.03	2354	3.71
30	4.86	0442	2.35	1048	5.16	1818	0.30		
31	4.06	0054	3.50	0530	2.71	1124	4.71	9118	0.61

TABLE 14. Point Mugu Tides, December 1996.

December 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	2.99	0230	3.66	0724	2.92	1230	3.88	2012	0.88
02	2.73	0324	3.86	0912	2.76	1348	3.46	2106	1.12
03	2.82	0412	4.12	1042	2.34	1530	3.23	2154	1.30
04	3.01	0448	4.44	1142	1.79	1648	3.22	2248	1.43
05	3.59	0524	4.79	1224	1.20	1754	3.34	2330	1.51
06	4.56	0554	5.16	1254	0.61	1854	3.50		
07	5.50	0006	1.57	0630	5.54	1336	0.04	1936	3.67
08	6.37	0048	1.60	0654	5.91	1412	-0.46	2024	3.81
09	7.07	0124	1.63	0736	6.21	1448	-0.86	2106	3.92
10	7.54	0206	1.66	0812	6.41	1530	-1.13	2148	3.99
11	7.68	0248	1.73	0848	6.46	1612	-1.22	2230	4.02
12	7.46	0330	1.83	0930	6.32	1654	-1.14	2318	4.05
13	6.88	0424	1.96	1018	5.98	1742	-0.90		
14	5.98	0012	4.09	0524	2.12	1112	5.46	1836	-0.52
15	4.88	0112	4.20	0636	2.22	1218	4.81	1930	-0.07
16	4.01	0224	4.40	0812	2.13	1336	4.15	2030	0.39
17	3.88	0324	4.68	0948	1.76	1512	3.67	2130	0.80
18	3.89	0418	5.02	1106	-1.17	1648	3.48	2230	1.13
19	4.82	0512	5.36	1212	0.54	1806	3.51	2330	1.37
20	5.65	0554	5.65	1306	0.00	1906	3.62		
21	6.26	0018	1.55	0636	5.86	1348	-0.40	1954	3.73
22	6.63	0054	1.67	0706	5.99	1424	-0.65	2036	3.80
23	6.78	0142	1.76	0742	6.02	1454	-0.76	2112	3.84
24	6.72	0218	1.84	0818	5.96	1536	-0.76	2148	3.84
25	6.49	0248	1.92	0854	5.83	1606	-0.66	2230	3.83
26	6.10	0324	2.01	0924	5.61	1642	-0.48	2306	3.81
27	5.55	0354	2.12	0954	5.31	1712	-0.24	2342	3.78
28	4.86	0442	2.25	1030	4.93	1748	0.07		
29	4.05	0024	3.78	0530	2.39	1106	4.47	1818	0.41
30	3.16	0106	3.80	0624	2.50	1148	3.95	1854	0.79
31	3.15	0112	3.80	0624	2.50	1142	3.95	1854	0.79

TABLE 13. Point Mugu Tides, November 1996.

November 1996

Mugu Lagoon (Ocean Pier), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	3.41	0230	3.46	0642	3.00	1218	4.26	2024	0.85
02	2.93	0348	3.63	0836	3.05	1342	3.90	2130	0.97
03	2.88	0442	3.89	1024	2.77	1518	3.73	2230	1.01
04	3.15	0518	4.18	1124	2.31	1636	3.76	2312	1.03
05	3.42	0548	4.48	1206	1.80	1736	3.87	2354	1.06
06	3.50	0618	4.79	1242	1.29	1824	4.00		
07	4.31	0024	1.10	0642	5.10	1318	0.79	1906	4.10
08	5.08	0054	1.16	0706	5.42	1348	0.33	1948	4.16
09	5.77	0124	1.25	0736	5.70	1424	-0.07	2030	4.18
10	6.31	0154	1.36	0754	5.93	1454	-0.38	2106	4.14
11	6.66	0224	1.52	0830	6.08	1542	-0.58	2148	4.04
12	6.76	0254	1.71	0900	6.11	1624	-0.65	2236	3.91
13	6.59	0336	1.95	0942	6.00	1706	-0.59	2330	3.78
14	6.16	0424	2.22	1024	5.74	1754	-0.42		
15	5.52	0036	3.71	0518	2.49	1124	5.34	1854	-0.18
16	4.79	0154	3.79	0642	2.68	1230	4.86	2006	0.07
17	4.13	0312	4.05	0824	2.60	1354	4.41	2112	0.28
18	3.98	0412	4.43	1006	2.15	1530	4.16	2212	0.45
19	4.26	0454	4.88	1118	1.49	1654	4.10	2312	0.62
20	4.52	0542	5.31	1218	0.79	1754	4.14	2354	0.80
21	5.51	0618	5.69	1306	0.18	1854	4.19		
22	6.27	0042	0.99	0648	5.98	1348	-0.29	1948	4.20
23	6.73	0118	1.20	0724	6.14	1430	-0.59	2030	4.16
24	6.91	0154	1.42	0800	6.18	1506	-0.72	2118	4.08
25	6.81	0230	1.65	0836	6.10	1548	-0.71	2206	3.96
26	6.48	0306	1.88	0912	5.91	1624	-0.57	2248	3.82
27	5.96	0342	2.12	0942	5.62	1706	-0.34	2336	3.69
28	5.31	0418	2.37	1018	5.26	1742	-0.05		
29	4.56	0030	3.60	0454	2.61	1054	4.83	1830	0.27
30	3.77	0130	3.58	0554	2.82	1136	4.36	1918	0.59

TABLE 15. San Nicolas Island Tides, January 1996.

January 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.03	0006	1.77	0624	4.96	1342	-0.07	1954	3.16
02	5.40	0042	1.84	0654	5.09	1418	-0.31	2036	3.27
03	5.65	0124	1.85	0730	5.19	1448	-0.46	2106	3.35
04	5.79	0154	1.83	0754	5.25	1518	-0.54	2136	3.42
05	5.80	0230	1.80	0830	5.25	1554	-0.55	2206	3.47
06	5.67	0306	1.78	0854	5.17	1618	-0.50	2236	3.51
07	5.39	0342	1.79	0930	5.01	1648	-0.37	2306	3.55
08	4.94	0418	1.83	1006	4.76	1718	-0.17	2336	3.58
09	4.33	0454	1.90	1036	4.42	1748	0.09		
10	3.58	0012	3.62	0542	1.97	1112	3.99	1818	0.41
11	2.91	0054	3.63	0642	2.07	1154	3.54	1854	0.72
12	2.67	0148	3.74	0800	2.01	1254	3.04	1936	1.07
13	2.55	0242	3.94	0936	1.71	1442	2.64	2030	1.39
14	3.07	0336	4.23	1106	1.16	1642	2.57	2142	1.61
15	4.13	0436	4.62	1212	0.49	1806	2.79	2254	1.68
16	5.25	0530	5.07	1254	-0.18	1906	3.10		
17	6.28	0006	1.62	0618	5.51	1348	-0.77	1954	3.42
18	7.09	0054	1.46	0706	5.89	1430	-1.20	2036	3.71
19	7.57	0148	1.26	0754	6.12	1512	-1.45	2118	3.95
20	7.64	0242	1.09	0842	6.16	1554	-1.48	2154	4.13
21	7.26	0330	0.98	0930	5.97	1624	-1.29	2242	4.25
22	6.48	0412	0.96	1012	5.55	1706	-0.93	2330	4.30
23	5.38	0506	1.04	1054	4.96	1748	-0.43		
24	4.14	0012	4.29	0606	1.18	1154	4.25	1830	0.15
25	3.50	0106	4.25	0718	1.32	1254	3.52	1924	0.75
26	2.91	0154	4.19	0854	1.34	1418	2.91	2018	1.29
27	3.05	0306	4.18	1030	1.13	1612	2.62	2124	1.70
28	3.49	0412	4.25	1154	0.76	1754	2.69	2242	1.93
29	4.01	0512	4.39	1248	0.38	1906	2.90	2348	1.97
30	4.50	0554	4.56	1330	0.06	1948	3.10		
31	4.89	0042	1.91	0642	4.74	1400	-0.17	2018	3.26

TABLE 16. San Nicolas Island Tides, February 1996.

February 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.24	0118	1.79	0718	4.89	1430	-0.34	2048	3.40
02	5.45	0148	1.65	0748	5.01	1454	-0.44	2112	3.53
03	5.53	0218	1.52	0818	5.05	1524	-0.47	2136	3.64
04	5.45	0254	1.41	0848	5.02	1548	-0.43	2154	3.74
05	5.21	0324	1.33	0918	4.89	1618	-0.32	2230	3.82
06	4.78	0406	1.29	0954	4.66	1648	-0.12	2254	3.88
07	4.19	0442	1.29	1024	4.33	1712	0.15	2324	3.93
08	3.49	0524	1.32	1054	3.91	1742	0.48	2354	3.97
09	2.57	0618	1.37	1148	3.42	1812	0.85		
10	2.75	0042	4.00	0724	1.38	1248	2.90	1848	1.25
11	2.82	0136	4.06	0854	1.24	1430	2.49	1936	1.63
12	3.35	0242	1.19	1030	0.84	1642	2.47	2106	1.89
13	4.17	0354	4.45	1142	0.28	1806	2.78	2242	1.90
14	5.12	0506	4.83	1236	-0.29	1854	3.16	2354	1.67
15	6.00	0606	5.23	1330	-0.76	1942	3.55		
16	6.65	0054	1.33	0654	5.57	1412	-1.08	2018	3.90
17	6.97	0148	0.96	0748	5.76	1448	-1.21	2054	4.21
18	6.90	0236	0.64	0836	5.76	1530	-1.15	2130	4.43
19	6.44	0324	0.42	0918	5.54	1606	-0.90	2212	4.56
20	5.62	0412	0.34	1006	5.12	1642	-0.50	2248	4.59
21	4.56	0454	0.40	1048	4.56	1712	0.01	2324	4.51
22	3.35	0542	0.56	1136	3.92	1748	0.56		
23	3.55	0006	4.34	0642	0.79	1236	3.27	1830	1.13
24	3.15	0054	4.13	0800	0.98	1354	2.74	1912	1.64
25	2.92	0154	3.93	0942	1.00	1554	2.50	2030	2.04
26	3.02	0312	3.82	1112	0.80	1754	2.66	2218	2.21
27	3.38	0430	3.89	1218	0.50	1848	2.92	2336	2.11
28	3.84	0530	4.07	1254	0.23	1924	3.15		
29	4.27	0030	1.90	0618	4.28	1336	0.01	1948	3.36

TABLE 18. San Nicolas Island Tides, April 1996.

April 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.12	0154	0.73	0742	4.19	1406	0.14	2012	4.26
02	4.27	0224	0.39	0818	4.21	1430	0.21	2036	4.48
03	4.57	0300	0.10	0854	4.14	1500	0.35	2106	4.67
04	4.91	0336	-0.12	0936	3.99	1530	0.56	2130	4.79
05	5.07	0412	-0.24	1018	3.75	1606	0.82	2206	4.83
06	5.03	0506	-0.26	1106	3.43	1636	1.14	2242	4.77
07	4.79	0554	-0.19	1206	3.10	1718	1.50	2330	4.61
08	2.90	0654	-0.05	1318	2.85	1806	1.85		
09	4.31	0024	4.36	0812	0.05	1454	2.81	1930	2.13
10	4.07	0142	4.12	0936	0.05	1624	3.06	2124	2.12
11	4.06	0312	4.00	1042	-0.06	1724	3.43	2248	1.76
12	4.24	0436	4.07	1136	-0.17	1812	3.84	2400	1.22
13	4.46	0548	4.22	1224	-0.22	1848	4.24		
14	4.75	0048	0.65	0642	4.33	1306	-0.17	1924	4.58
15	4.88	0136	0.15	0736	4.36	1354	-0.03	1954	4.85
16	5.24	0224	-0.23	0818	4.29	1424	0.19	2024	5.01
17	5.53	0306	-0.47	0906	4.12	1454	0.47	2054	5.06
18	5.54	0348	-0.56	0948	3.88	1530	0.80	2130	4.99
19	5.32	0424	-0.51	1030	3.59	1606	1.14	2154	4.81
20	4.90	0506	-0.34	1118	3.29	1636	1.50	2236	4.55
21	4.34	0554	-0.10	1212	3.01	1706	1.84	2312	4.24
22	3.72	0636	0.17	1324	2.80	1748	2.16	2354	3.89
23	2.35	0736	0.42	1454	2.76	1854	2.41		
24	2.96	0048	3.54	0848	0.58	1618	2.92	2048	2.48
25	2.64	0212	3.27	1006	0.63	1712	3.16	2242	2.24
26	2.81	0342	3.19	1054	0.62	1748	3.42	2342	1.85
27	3.12	0454	3.26	1142	0.59	1812	3.71		
28	3.44	0024	1.39	0554	3.39	1218	0.57	1836	4.01
29	3.75	0054	0.92	0642	3.53	1254	0.58	1854	4.33
30	4.20	0136	0.45	0724	3.64	1324	0.62	1930	4.65

TABLE 17. San Nicolas Island Tides, March 1996.

March 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.62	0106	1.64	0654	4.48	1354	-0.14	2012	3.55
02	4.85	0136	1.37	0730	4.62	1424	-0.22	2036	3.73
03	4.95	0206	1.12	0806	4.70	1448	-0.24	2054	3.91
04	4.88	0242	0.90	0836	4.69	1512	-0.19	2118	4.08
05	4.65	0312	0.71	0906	4.58	1542	-0.06	2142	4.21
06	4.23	0354	0.58	0942	4.38	1612	0.14	2212	4.31
07	3.94	0430	0.52	1018	4.07	1636	0.42	2242	4.36
08	3.84	0512	0.52	1054	3.67	1706	0.77	2312	4.36
09	3.73	0554	0.58	1148	3.21	1736	1.15	2354	4.30
10	2.12	0706	0.65	1254	2.77	1818	1.55		
11	3.57	0048	4.21	0830	0.65	1448	2.52	1918	1.92
12	3.71	0206	4.15	1000	0.44	1642	2.66	2106	2.10
13	4.16	0330	4.23	1112	0.07	1754	3.03	2242	1.93
14	4.78	0454	4.48	1212	-0.30	1842	3.44	2354	1.51
15	5.36	0554	4.78	1306	-0.58	1918	3.85		
16	5.74	0054	1.01	0654	5.02	1348	-0.72	1954	4.22
17	5.84	0148	0.53	0742	5.13	1424	-0.71	2024	4.53
18	5.62	0230	0.14	0824	5.07	1454	-0.55	2054	4.74
19	5.12	0312	-0.11	0912	4.86	1536	-0.26	2130	4.84
20	5.02	0354	-0.21	0954	4.50	1606	0.12	2206	4.82
21	4.83	0442	-0.15	1036	4.05	1636	0.57	2242	4.67
22	4.41	0524	0.03	1124	3.56	1706	1.04	2318	4.43
23	3.84	0612	0.29	1218	3.08	1742	1.51	2354	4.13
24	2.14	0712	0.56	1336	2.70	1824	1.93		
25	3.06	0048	3.81	0836	0.75	1536	2.57	1936	2.27
26	2.80	0154	3.55	1006	0.75	1724	2.75	2142	2.38
27	2.85	0330	3.46	1118	0.60	1812	3.01	2318	2.17
28	3.13	0448	3.56	1212	0.43	1842	3.27		
29	3.47	0012	1.84	0548	3.75	1248	0.28	1906	3.51
30	3.76	0048	1.47	0630	3.95	1318	0.18	1930	3.76
31	3.94	0124	1.09	0712	4.10	1342	0.13	1948	4.01

TABLE 19. San Nicolas Island Tides, May 1996.

May 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	3.89	0130	0.97	0706	3.72	1324	0.39	1936	4.28
02	3.96	0154	0.56	0748	3.73	1348	0.54	1954	4.50
03	4.50	0224	0.19	0824	3.69	1406	0.73	2018	4.70
04	4.96	0254	-0.10	0854	3.59	1430	0.95	2036	4.86
05	5.28	0330	-0.32	0936	3.43	1454	1.19	2054	4.95
06	5.43	0406	-0.45	1012	3.23	1524	1.45	2124	4.98
07	5.41	0448	-0.47	1054	2.99	1542	1.73	2154	4.94
08	5.22	0530	-0.42	1154	2.75	1606	2.01	2224	4.80
09	4.87	0618	-0.30	1312	2.59	1636	2.29	2306	4.57
10	2.82	0724	-0.17	1506	2.65	1724	2.59		
11	4.13	0418	3.67	1100	0.14	1736	4.27	2354	0.96
12	4.31	0536	3.65	1148	0.30	1812	4.62		
13	4.49	0048	0.40	0636	3.67	1230	0.49	1848	4.90
14	5.15	0136	-0.06	0730	3.67	1312	0.70	1924	5.09
15	5.58	0218	-0.39	0818	3.63	1354	0.92	1954	5.19
16	5.79	0254	-0.59	0906	3.56	1430	1.15	2030	5.20
17	5.78	0336	-0.67	0948	3.46	1454	1.38	2054	5.12
18	5.59	0412	-0.63	1030	3.34	1536	1.61	2130	4.96
19	5.24	0454	-0.51	1112	3.21	1606	1.83	2206	4.73
20	4.76	0530	-0.32	1154	3.10	1642	2.06	2236	4.44
21	4.19	0612	-0.09	1254	3.03	1724	2.27	2318	4.10
22	3.57	0654	0.16	1354	3.04	1824	2.44	2354	3.73
23	2.75	0742	0.40	1506	3.15	1954	2.50		
24	2.75	0054	3.36	0836	0.61	1554	3.35	2136	2.32
25	2.84	0224	3.06	0936	0.77	1642	3.62	2254	1.93
26	3.03	0354	2.93	1030	0.89	1712	3.92	2354	1.43
27	3.29	0512	2.95	1112	0.98	1742	4.27		
28	3.77	0036	0.88	0612	3.07	1154	1.05	1818	4.65
29	4.71	0118	0.31	0706	3.21	1236	1.12	1848	5.02
30	5.59	0154	-0.22	0754	3.36	1312	1.18	1924	5.37
31	6.26	0236	-0.69	0842	3.47	1348	1.25	1954	5.63

TABLE 20. San Nicolas Island Tides, June 1996.

June 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	6.82	0318	-1.04	0930	3.54	1430	1.34	2042	5.78
02	7.01	0354	-1.24	1018	3.57	1518	1.45	2124	5.77
03	6.85	0442	-1.27	1106	3.58	1606	1.60	2212	5.58
04	6.35	0530	-1.14	1206	3.60	1700	1.76	2254	5.21
05	5.58	0624	-0.87	1306	3.66	1818	1.91	2354	4.71
06	4.31	0724	-0.51	1406	3.80	1936	1.94		
07	4.25	0112	4.14	0824	-0.11	1506	4.02	2112	1.75
08	4.03	0230	3.64	0924	0.28	1606	4.30	2242	1.34
09	3.97	0354	3.32	1024	0.63	1654	4.60	2348	0.83
10	3.94	0524	3.20	1118	0.92	1742	4.86		
11	4.72	0048	0.34	0636	3.21	1200	1.16	1824	5.06
12	5.26	0130	-0.06	0730	3.26	1242	1.36	1854	5.20
13	5.61	0212	-0.34	0818	3.31	1324	1.52	1936	5.27
14	5.78	0248	-0.51	0906	3.34	1400	1.65	2006	5.27
15	5.80	0324	-0.58	0942	3.35	1436	1.76	2036	5.22
16	5.68	0354	-0.57	1018	3.35	1512	1.86	2112	5.10
17	5.42	0436	-0.49	1054	3.34	1548	1.97	2142	4.93
18	5.03	0506	-0.35	1136	3.33	1624	2.09	2212	4.68
19	4.51	0542	-0.15	1218	3.34	1706	2.21	2248	4.36
20	3.88	0618	0.09	1254	3.37	1754	2.33	2330	3.98
21	3.08	0654	i0.37	1348	3.45	1900	2.38		
22	2.94	0018	3.55	0730	0.66	1436	3.60	2030	2.29
23	2.87	0118	3.13	0818	0.95	1524	3.82	2200	1.98
24	2.91	0248	2.81	0906	1.20	1612	4.12	2312	1.49
25	3.08	0430	2.71	1006	1.40	1654	4.47		
26	3.98	0012	0.90	0548	2.81	1054	1.52	1736	4.88
27	5.01	0054	0.28	0654	3.01	1154	1.57	1818	5.30
28	5.98	0142	-0.30	0742	3.25	1242	1.56	1854	5.68
29	6.78	0224	-0.80	0830	3.48	1336	1.51	1942	5.98
30	7.29	0306	-1.16	0918	3.68	1424	1.46	2030	6.13

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TABLE 21. San Nicolas Island Tides, July 1996.

July 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	7.43	0348	-1.34	0954	3.84	1506	1.43	2112	6.09
02	7.17	0424	-1.33	1048	3.97	1600	1.44	2154	5.84
03	6.51	0512	-1.13	1136	4.08	1654	1.50	2254	5.39
04	5.54	0600	-0.76	1230	4.17	1800	1.58	2348	4.78
05	4.55	0648	-0.28	1324	4.27	1918	1.62		
06	4.13	0054	4.11	0742	0.25	1424	4.38	2048	1.53
07	3.75	0212	3.49	0836	0.78	1524	4.53	2218	1.25
08	3.85	0348	3.09	0942	1.22	1618	4.70	2336	0.84
09	3.33	0518	2.98	1042	1.55	1712	4.87		
10	4.60	0036	0.43	0636	3.06	1142	1.75	1754	5.02
11	5.06	0124	0.09	0736	3.19	1224	1.85	1842	5.15
12	5.38	0200	-0.15	0818	3.32	1306	1.89	1918	5.23
13	5.57	0236	-0.30	0854	3.42	1342	1.89	1954	5.27
14	5.64	0306	-0.37	0924	3.50	1418	1.87	2024	5.27
15	5.57	0336	-0.37	0954	3.57	1454	1.86	2054	5.20
16	5.37	0412	-0.31	1024	3.63	1536	1.86	2124	5.06
17	5.02	0436	-0.19	1054	3.68	1612	1.89	2154	4.83
18	4.52	0506	0.00	1130	3.72	1648	1.94	2230	4.52
19	3.88	0536	0.25	1154	3.76	1730	2.01	2306	4.13
20	3.27	0606	0.55	1236	3.82	1824	2.06	2348	3.69
21	3.02	0636	0.89	1318	3.90	1930	2.05		
22	2.81	0042	3.22	0712	1.23	1406	4.04	2100	1.86
23	2.81	0206	2.81	0800	1.56	1506	4.26	2230	1.45
24	3.69	0354	2.65	0900	1.82	1606	4.57	2336	0.88
25	3.02	0542	2.79	1024	1.95	1654	4.97		
26	5.12	0036	0.27	0642	3.08	1130	1.92	1754	5.40
27	6.09	0124	-0.29	0730	3.41	1230	1.76	1842	5.80
28	6.85	0206	-0.75	0818	3.73	1324	1.54	1930	6.10
29	7.28	0248	-1.05	0854	4.02	1412	1.32	2018	6.23
30	7.30	0330	-1.16	0936	4.27	1506	1.13	2106	6.14
31	6.89	0406	-1.06	1018	4.46	1548	1.03	2154	5.83

TABLE 22. San Nicolas Island Tides, August 1996.

August 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	6.09	0448	-0.77	1054	4.58	1642	1.03	2242	5.32
02	4.99	0524	-0.32	1148	4.63	1742	1.11	2336	4.67
03	4.39	0606	0.23	1236	4.62	1848	1.23		
04	3.76	0036	3.97	0654	0.82	1330	4.57	2012	1.30
05	3.33	0154	3.35	0748	1.37	1430	4.53	2148	1.20
06	3.62	0336	2.99	0854	1.82	1536	4.55	2312	0.92
07	2.55	0524	2.98	1018	2.09	1642	4.64		
08	4.19	0018	0.59	0636	3.17	1130	2.16	1736	4.78
09	4.62	0106	0.31	0724	3.37	1224	2.11	1824	4.93
10	4.96	0148	0.11	0754	3.53	1306	1.99	1906	5.06
11	5.17	0218	-0.02	0830	3.67	1336	1.85	1936	5.15
12	5.26	0242	-0.08	0854	3.80	1412	1.71	2012	5.18
13	5.22	0306	-0.08	0918	3.91	1442	1.59	2042	5.14
14	5.03	0330	-0.01	0942	4.02	1512	1.50	2112	5.02
15	4.68	0400	0.12	1012	4.10	1554	1.46	2142	4.80
16	4.18	0430	0.32	1036	4.17	1630	1.45	2212	4.49
17	3.63	0454	0.58	1106	4.21	1712	1.49	2248	4.11
18	3.34	0524	0.90	1136	4.23	1754	1.54	2330	3.67
19	3.00	0548	1.25	1212	4.25	1854	1.58		
20	2.76	0030	3.20	0624	1.61	1254	4.28	2024	1.52
21	3.12	0154	2.81	0712	1.97	1406	4.35	2154	1.24
22	3.78	0406	2.74	0824	2.24	1524	4.55	2312	0.76
23	2.58	0536	3.00	1006	2.29	1636	4.87		
24	5.03	0006	0.24	0630	3.36	1124	2.08	1736	5.27
25	5.87	0054	-0.23	0712	3.75	1230	1.72	1830	5.64
26	6.46	0142	-0.57	0748	4.13	1318	1.31	1918	5.89
27	6.71	0224	-0.74	0830	4.48	1412	0.93	2006	5.97
28	6.56	0254	-0.73	0906	4.76	1454	0.64	2054	5.83
29	6.02	0336	-0.53	0942	4.96	1548	0.47	2142	5.49
30	5.22	0418	-0.18	1018	5.04	1636	0.46	2230	4.98
31	4.70	0454	0.30	1054	5.00	1724	0.58	2324	4.38

TABLE 23. San Nicolas Island Tides, September 1996.

September 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.06	0536	0.85	1142	4.86	1824	0.80		
02	3.63	0018	3.76	0612	1.41	1230	4.63	1936	1.01
03	3.30	0142	3.24	0700	1.93	1330	4.40	2100	1.10
04	3.26	0330	3.01	0812	2.33	1448	4.24	2230	0.98
05	3.49	0518	3.13	0954	2.48	1606	4.25	2348	0.76
06	2.00	0624	3.37	1124	2.38	1712	4.38		
07	4.02	0036	0.54	0654	3.60	1218	2.16	1806	4.56
08	4.33	0112	0.39	0730	3.79	1254	1.90	1842	4.72
09	4.54	0142	0.29	0754	3.97	1330	1.63	1918	4.83
10	4.63	0212	0.25	0818	4.14	1354	1.38	1954	4.88
11	4.58	0236	0.28	0836	4.31	1430	1.16	2024	4.85
12	4.38	0254	0.36	0854	4.46	1500	0.98	2054	4.74
13	4.07	0318	0.50	0924	4.58	1530	0.86	2130	4.54
14	3.95	0342	0.71	0948	4.66	1606	0.81	2206	4.26
15	3.88	0406	0.98	1018	4.69	1654	0.81	2242	3.91
16	3.81	0442	1.29	1048	4.68	1736	0.87	2330	3.52
17	3.66	0512	1.64	1124	4.62	1836	0.95		
18	3.52	0036	3.13	0548	2.00	1212	4.51	1954	0.99
19	3.56	0212	2.89	0642	2.35	1324	4.41	2124	0.85
20	3.87	0412	3.00	0830	2.56	1448	4.42	2242	0.55
21	4.42	0524	3.35	1012	2.41	1612	4.62	2336	0.20
22	2.93	0612	3.76	1124	1.99	1724	4.92		
23	5.28	0024	-0.08	0648	4.19	1224	1.45	1818	5.19
24	5.60	0106	-0.25	0724	4.60	1312	0.91	1912	5.36
25	5.63	0148	-0.27	0754	4.96	1406	0.44	1954	5.36
26	5.37	0230	-0.14	0830	5.23	1448	0.10	2048	5.20
27	5.45	0306	0.12	0906	5.38	1536	-0.07	2130	4.89
28	5.46	0342	0.49	0942	5.39	1624	-0.06	2218	4.47
29	5.17	0418	0.93	1018	5.26	1706	0.09	2312	4.00
30	4.65	0454	1.41	1054	5.01	1754	0.36		

TABLE 24. San Nicolas Island Tides, October 1996.

October 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.02	0012	3.54	0530	1.89	1136	4.67	1854	0.65
02	3.42	0130	3.19	0612	2.33	1230	4.30	2012	0.88
03	3.03	0318	3.09	0730	2.66	1342	3.98	2136	0.94
04	2.96	0454	3.27	0936	2.71	1512	3.83	2248	0.87
05	3.13	0548	3.53	1106	2.47	1636	3.89	2348	0.76
06	1.91	0624	3.77	1154	2.12	1730	4.03		
07	3.52	0024	0.67	0648	4.01	1242	1.74	1818	4.19
08	3.69	0054	0.62	0712	4.24	1318	1.37	1854	4.31
09	3.84	0124	0.62	0730	4.47	1348	1.01	1936	4.37
10	4.02	0154	0.67	0754	4.69	1418	0.69	2006	4.37
11	4.46	0218	0.76	0818	4.89	1442	0.42	2042	4.30
12	4.82	0236	0.90	0842	5.05	1518	0.22	2118	4.16
13	5.04	0306	1.10	0912	5.15	1554	0.11	2154	3.95
14	5.09	0330	1.34	0942	5.17	1636	0.08	2242	3.68
15	4.98	0406	1.63	1012	5.12	1730	0.14	2336	3.40
16	4.70	0442	1.94	1054	4.96	1824	0.26		
17	4.34	0048	3.17	0530	2.27	1142	4.72	1936	0.38
18	4.03	0224	3.13	0642	2.56	1254	4.44	2054	0.41
19	3.91	0354	3.36	0842	2.61	1424	4.25	2206	0.34
20	4.01	0454	3.73	1024	2.28	1554	4.25	2306	0.24
21	4.20	0542	4.16	1130	1.71	1712	4.38	2354	0.18
22	3.52	0618	4.60	1224	1.08	1812	4.52		
23	4.80	0036	0.20	0654	5.00	1312	0.49	1906	4.60
24	5.32	0118	0.31	0724	5.32	1354	0.01	1954	4.57
25	5.86	0154	0.51	0754	5.54	1442	-0.31	2042	4.44
26	6.09	0236	0.77	0836	5.63	1524	-0.46	2130	4.23
27	6.02	0306	1.09	0906	5.58	1606	-0.44	2212	3.96
28	5.68	0342	1.43	0942	5.40	1654	-0.29	2306	3.67
29	5.13	0418	1.80	1018	5.10	1736	-0.03	2354	3.40
30	4.46	0454	2.15	1054	4.73	1830	0.27		
31	3.70	0106	3.21	0542	2.48	1136	4.32	1924	0.56

TABLE 25. San Nicolas Island Tides, November 1996.

November 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	3.13	0236	3.18	0654	2.75	1230	3.91	2030	0.78
02	2.68	0354	3.33	0842	2.80	1354	3.57	2136	0.89
03	2.64	0454	3.57	1030	2.54	1530	3.42	2236	0.93
04	2.89	0530	3.83	1130	2.11	1648	3.45	2318	0.94
05	2.46	0554	4.11	1218	1.65	1742	3.55		
06	3.42	0006	0.97	0624	4.39	1254	1.18	1830	3.66
07	3.95	0036	1.01	0648	4.68	1330	0.73	1912	3.76
08	4.66	0106	1.06	0712	4.96	1354	0.30	1954	3.82
09	5.29	0136	1.14	0742	5.22	1436	-0.06	2036	3.83
10	5.79	0206	1.25	0806	5.44	1512	-0.35	2112	3.79
11	6.10	0236	1.39	0842	5.57	1548	-0.53	2154	3.71
12	6.20	0306	1.57	0912	5.60	1630	-0.60	2248	3.58
13	6.04	0342	1.78	0954	5.50	1712	-0.54	2342	3.46
14	5.65	0430	2.03	1036	5.26	1806	-0.38		
15	5.06	0048	3.40	0524	2.28	1130	4.90	1912	-0.16
16	4.39	0154	3.47	0654	2.45	1236	4.45	2018	0.06
17	3.79	0318	3.71	0836	2.38	1354	4.04	2124	0.25
18	3.65	0418	4.06	1018	1.97	1536	3.81	2224	0.42
19	3.90	0506	4.47	1130	1.36	1654	3.76	2324	0.57
20	4.14	0548	4.87	1230	0.73	1806	3.80		
21	5.05	0006	0.73	0624	5.22	1312	0.17	1906	3.84
22	5.74	0048	0.91	0654	5.48	1354	-0.27	1954	3.85
23	6.17	0124	1.10	0736	5.63	1436	-0.54	2042	3.82
24	6.33	0200	1.30	0812	5.67	1512	-0.66	2130	3.74
25	6.24	0236	1.51	0842	5.59	1554	-0.65	2212	3.63
26	5.94	0318	1.72	0918	5.42	1636	-0.52	2254	3.51
27	5.46	0354	1.95	0948	5.15	1718	-0.31	2342	3.39
28	4.87	0430	2.17	1024	4.82	1754	-0.04		
29	4.18	0036	3.30	0512	2.39	1054	4.43	1842	0.25
30	3.45	0136	3.28	0612	2.59	1142	4.00	1930	0.54

TABLE 26. San Nicolas Island Tides, December 1996.

December 1996

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	2.74	0236	3.36	0736	2.68	1242	3.55	2018	0.81
02	2.51	0336	3.53	0918	2.53	1354	3.17	2112	1.03
03	2.59	0424	3.78	1048	2.14	1542	2.96	2206	1.19
04	2.76	0454	4.07	1148	1.64	1654	2.95	2254	1.31
05	3.29	0536	4.39	1236	1.10	1806	3.06	2342	1.38
06	4.18	0606	4.73	1312	0.56	1854	3.21		
07	5.04	0018	1.43	0636	5.08	1348	0.04	1942	3.36
08	5.84	0054	1.47	0706	5.42	1424	-0.42	2030	3.49
09	6.49	0136	1.49	0742	5.70	1454	-0.79	2112	3.59
10	6.91	0218	1.52	0818	5.88	1542	-1.03	2154	3.66
11	7.04	0254	1.58	0854	5.92	1618	-1.12	2242	3.69
12	6.84	0336	1.67	0942	5.80	1700	-1.05	2330	3.71
13	6.31	0430	1.80	1030	5.48	1748	-0.82		
14	5.48	0024	3.75	0530	1.94	1124	5.00	1842	-0.48
15	4.47	0124	3.85	0642	2.03	1224	4.41	1942	-0.06
16	3.67	0230	4.03	0824	1.95	1342	3.81	2042	0.36
17	3.56	0330	4.29	0954	1.61	1518	3.37	2142	0.74
18	3.57	0424	4.60	1118	1.07	1654	3.19	2242	1.04
19	4.42	0518	4.91	1224	0.49	1812	3.22	2342	1.26
20	5.18	0554	5.18	1318	0.00	1912	3.32		
21	5.74	0030	1.42	0642	5.37	1354	-0.37	2006	3.42
22	6.08	0106	1.53	0718	5.49	1430	-0.59	2048	3.48
23	6.21	0148	1.62	0754	5.52	1506	-0.70	2124	3.52
24	6.16	0224	1.69	0830	5.47	1542	-0.69	2154	3.52
25	5.95	0254	1.76	0854	5.34	1618	-0.61	2236	3.51
26	5.59	0336	1.84	0930	5.14	1654	-0.44	2312	3.49
27	5.09	0412	1.94	1006	4.87	1724	-0.22	2348	3.47
28	4.45	0454	2.06	1036	4.51	1754	0.06		
29	3.71	0030	3.46	0542	2.19	1112	4.09	1830	0.38
30	2.90	0112	3.49	0636	2.29	1154	3.62	1912	0.72
31	2.89	0118	3.49	0636	2.29	1154	3.62	1906	0.72

Appendix A

HEIGHT OF THE TIDE AT ANY TIME

The height of the tide at times intermediate to the times of high and low water is needed on occasion, and may be computed by numerical methods. An example of the method, (adapted from Table 3 of the data source), is presented here, using the predicted tides for a day at Point Mugu.

Problem: Given that the predicted times and heights of the tides are:

TIME	HEIGHT
0039	4.9
0814	0.2
1510	3.1
1933	2.4

What is the height of the tide at 0300?

Numerical Method

The duration of fall is 08h 14m - 00h 39m = 7h 35m

The time after high water is 03h 00m - 00h 39m = 2h 21m

The range of tide is 4.9 - 0.2 = 4.7 feet

Entering Table A-1 at the duration of fall of 7h 40m, which is the nearest value to 6h 35m, the nearest value on the horizontal line to 2h 21m is 2h 18m after high water. Following down this column to its intersection with a range of 4.5 feet which is the nearest value to 4.7 feet, one obtains 0.9 which, being calculated from high water, must be subtracted from 4.9. The approximate height at 0300 is therefore 4.0 feet.

When the duration of rise or fall is greater than 10h 40m, enter the table with one-half the given duration and with one-half the time from nearest high or low water; but if the duration of rise or fall is less than 4h 00m, enter the table with double the given duration and time.

TABLE A-1. Height of the Tide at Any Time.

h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.
4 00	0 08	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4.20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4.40	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30
9 20	0 19	0 37	0 56	1 15	1 33	1 52	2 11	2 29	2 48	3 07	3 25	3 44	4 03	4 21	4 40
9 40	0 19	0 39	0 58	1 17	1 37	1 56	2 15	2 35	2 54	3 13	3 33	3 52	4 11	4 31	4 50
10 00	0 20	0 40	1 00	1 20	1 40	2 00	2 20	2 40	3 00	3 20	3 40	4 00	4 20	4 40	5 00
10 20	0 21	0 41	1 02	1 23	1 43	2 04	2 25	2 45	3 06	3 27	3 47	4 08	4 29	4 49	5 10
10 40	0 21	0 43	1 04	1 25	1 47	2 08	2 29	2 51	3 12	3 33	3 55	4 16	4 37	4 59	5 20

Left axis: Duration of rise or fall, see footnote. Top: Time from the nearest high water or low water.

Correction to Height

Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5
7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8
8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0
8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.8	4.2
9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5
9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8
10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0
10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2
11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.8	2.3	2.8	3.3	3.8	4.4	4.9	5.5
11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.1	5.8
12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.0	3.6	4.1	4.8	5.4	6.0
12.5	0.0	0.1	0.3	0.5	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.3	5.0	5.6	6.2
13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5
13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8
14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0
14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2
15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5
15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8
16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0
16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2
17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5
17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8
18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0
18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2
19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5
19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8
20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0

Left axis: Range of tide, see footnote.

1. Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.

2. Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below on the line with the range of tide.

3. When the nearest tide is high water, subtract the correction.

4. When the nearest tide is low water, add the correction.

GRAPHICAL METHOD

If the height of the tide is required for a number of times on a certain day the fill tide curve for the day, may be obtained by the *one-quarter, one-tenth rule*. The procedure is as follows:

1. On cross-section paper plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.

2. Draw light straight lines connecting the points representing successive high and low waters.

3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.

4. At the quarter point adjacent to high water, draw a vertical line above the point, and at the quarter point adjacent to low water, draw a vertical line below the point, making the length of these lines equal to one-tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.

5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will approximate the actual tide curve and heights for any time of the day may be readily scaled from it. The resulting graph is shown in Figure A-1.

CAUTION

Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.
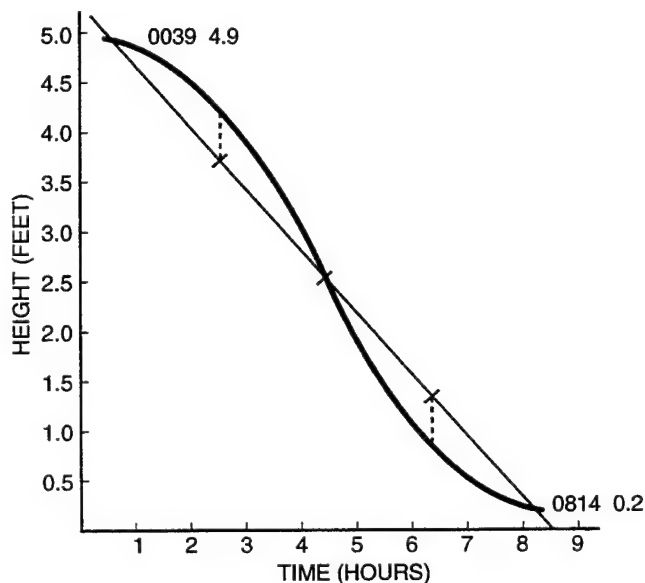

FIGURE A-1. Tidal Curve for Solution of the Problem.

Appendix B
EQUINOXES, SOLSTICES, AND LUNAR PHASES 1996

The dates and times for Vernal and Autumnal Equinoxes and Summer and Winter Solstices during 1996 are listed in Table B-1. The 1996 dates and times for phases of the moon are given in Table B-2. Times are Pacific Standard, add 1 hour when Daylight Savings Time is in effect.

TABLE B-1. Equinoxes and Solstices, 1996, Point Mugu Area.

Vernal Equinox	20 March	0003 PST	Beginning of Spring Day and night equal length
Summer Solstice	20 June	1824 PST	Beginning of Summer Greatest duration daylight
Autumnal Equinox	22 September	1000 PST	Beginning of Autumn Day and night equal length
Winter Solstice	21 December	0606 PST	Beginning of Winter Greatest duration darkness

TABLE B-2. Lunar Phases, 1996, Point Mugu Area.

	JANUARY DATE	TIME	FEBRUARY DATE	TIME	MARCH DATE	TIME	APRIL DATE	TIME
Full Moon	5	1251	4	0758	5	0123	3	1607
Last Quarter	13	1245	12	0037	12	0915	10	1536
New Moon	20	0450	18	1530	19	0245	17	1449
First Quarter	27	0314	25	2152	26	1731	25	1240

	MAY DATE	TIME	JUNE DATE	TIME	JULY DATE	TIME	AUGUST DATE	TIME
Full Moon	3	0348	1	1247	--	--	--	--
Last Quarter	9	2104	8	0305	7	1055	5	2125
New Moon	17	0346	15	1736	15	0815	13	2334
First Quarter	25	0613	23	2123	23	0949	21	1936
Full Moon	--	--	30	1958	30	0235	28	0952

	SEPTEMBER DATE	TIME	OCTOBER DATE	TIME	NOVEMBER DATE	TIME	DECEMBER DATE	TIME
Full Moon	--	--	--	--	--	--	--	--
Last Quarter	4	1106	4	0404	2	2350	2	2106
New Moon	12	1507	12	0614	10	2016	10	0856
First Quarter	20	0323	19	1009	17	1709	17	0131
Full Moon	26	1851	26	0611	24	2010	24	1241

Because the earth's period of revolution about the sun (365.24+ days) is not evenly divisible by the moon's period of revolution about the earth (27.321 days), the dates and times of lunar phases, moonrise and moonset, and tidal data must be recomputed for each year. The following information, however, is based on geometrical relationships and holds true for all times:

1. The New Moon rises at sunrise, crosses the meridian at noon, and sets at sunset.

2. The First Quarter Moon rises at noon, crosses the meridian at sunset, and sets at sunrise.

3. The Full Moon rises at sunset, crosses the meridian at midnight, and sets at sunrise.

4. The Last Quarter Moon rises at midnight, crosses the meridian at sunrise and sets at noon.

TABLE C-1 Sunrise and Sunset for Point Mugu (January-June).

Sunrise, Sunset, and Duration of Twilight for Point Mugu, CA.
34-07' N, 119-07' W
(January to June)

Note: All times are Pacific Standard Time. (120th Meridian):
Add 1 hour when Daylight Savings is in effect:

Date	January Sun-rise	Sun-set	February Sun-rise	Sun-set	March Sun-rise	Sun-set	April Sun-rise	Sun-set	May Sun-rise	Sun-set	June Sun-rise	Sun-set	Date
1	0702	1658	0654	1727	0626	1753	0544	1817	0507	1840	0446	1903	1
2	0703	1659	0653	1728	0624	1753	0543	1818	0506	1841	0446	1903	2
3	0703	1700	0652	1729	0623	1754	0541	1819	0505	1842	0445	1904	3
4	0703	1700	0652	1730	0622	1755	0540	1819	0504	1843	0445	1904	4
5	0703	1701	0651	1731	0621	1756	0539	1820	0503	1843	0445	1905	5
6	0703	1702	0650	1732	0619	1757	0537	1821	0502	1844	0445	1905	6
7	0703	1703	0649	1733	0618	1758	0536	1822	0502	1845	0445	1906	7
8	0703	1704	0648	1734	0617	1758	0535	1822	0501	1846	0444	1906	8
9	0703	1705	0647	1734	0615	1759	0533	1823	0500	1846	0444	1907	9
10	0703	1705	0647	1735	0614	1800	0532	1824	0459	1847	0444	1907	10
11	0703	1706	0646	1736	0613	1801	0531	1825	0458	1848	0444	1908	11
12	0703	1707	0645	1737	0611	1802	0530	1825	0457	1849	0444	1908	12
13	0703	1708	0644	1738	0610	1802	0528	1826	0456	1849	0444	1909	13
14	0702	1709	0643	1739	0609	1803	0527	1827	0456	1850	0444	1909	14
15	0702	1710	0642	1740	0607	1804	0526	1828	0455	1851	0444	1909	15
16	0702	1711	0641	1741	0606	1805	0525	1829	0454	1852	0444	1910	16
17	0702	1712	0640	1742	0605	1806	0523	1829	0453	1852	0444	1910	17
18	0701	1713	0638	1743	0603	1806	0522	1830	0453	1853	0445	1910	18
19	0701	1714	0637	1744	0602	1807	0521	1831	0452	1854	0445	1911	19
20	0701	1715	0636	1745	0601	1808	0520	1832	0451	1855	0445	1911	20
21	0700	1716	0635	1746	0559	1809	0518	1832	0451	1855	0445	1911	21
22	0700	1717	0634	1747	0558	1809	0517	1833	0450	1856	0445	1911	22
23	0659	1718	0633	1747	0556	1810	0516	1834	0450	1857	0446	1911	23
24	0659	1719	0632	1748	0555	1811	0515	1835	0449	1857	0446	1912	24
25	0658	1720	0630	1749	0554	1812	0514	1835	0449	1858	0446	1912	25
26	0658	1721	0629	1750	0552	1813	0513	1836	0448	1859	0446	1912	26
27	0657	1722	0628	1751	0551	1813	0512	1837	0448	1900	0447	1912	27
28	0657	1723	0627	1752	0550	1814	0511	1838	0447	1900	0447	1912	28
29	0656	1724	0626	1752	0548	1815	0509	1839	0447	1901	0447	1912	29
30	0655	1725			0547	1816	0508	1839	0447	1901	0448	1912	30
31	0655	1726			0546	1816			0446	1902			31

	January	February	March	April	May	June	
	Average Twilight Civil: 27 min Nautical: 58 min	Average Twilight Civil: 26 min Nautical: 55 min	Average Twilight Civil: 25 min Nautical: 54 min	Average Twilight Civil: 26 min Nautical: 57 min	Average Twilight Civil: 28 min Nautical: 61 min	Average Twilight Civil: 29 min Nautical: 63 min	

Retain for use in future years. These data valid through 2020.

TABLE C-2 Sunrise and Sunset for Point Mugu (July-December).

Sunrise, Sunset, and Duration of Twilight for Point Mugu, CA.
34-07' N, 119-07' W
(July to December)

Note: All times are Pacific Standard Time. (120th Meridian):
Add 1 hour when Daylight Savings is in effect:

Date	July Sunrise	July Sunset	August Sunrise	August Sunset	September Sunrise	September Sunset	October Sunrise	October Sunset	November Sunrise	November Sunset	December Sunrise	December Sunset	Date
1	0448	1912	0507	1858	0530	1823	0551	1741	0616	1704	0644	1647	1
2	0449	1912	0508	1857	0530	1821	0551	1740	0617	1703	0645	1647	2
3	0449	1912	0509	1856	0531	1820	0552	1738	0618	1702	0646	1647	3
4	0450	1912	0510	1855	0532	1819	0553	1737	0619	1701	0646	1647	4
5	0450	1912	0510	1854	0532	1817	0554	1736	0620	1700	0647	1647	5
6	0451	1911	0511	1853	0533	1816	0554	1734	0621	1659	0648	1647	6
7	0451	1911	0512	1852	0534	1815	0555	1733	0621	1658	0649	1647	7
8	0452	1911	0512	1851	0535	1813	0556	1732	0622	1658	0650	1647	8
9	0452	1911	0513	1850	0535	1812	0557	1730	0623	1657	0650	1647	9
10	0453	1910	0514	1849	0536	1810	0557	1729	0624	1656	0651	1647	10
11	0453	1910	0515	1848	0537	1809	0558	1728	0625	1655	0652	1647	11
12	0454	1910	0515	1847	0537	1808	0559	1726	0626	1655	0653	1648	12
13	0454	1909	0516	1846	0538	1806	0600	1725	0627	1654	0653	1648	13
14	0455	1909	0517	1845	0539	1805	0601	1724	0628	1653	0654	1648	14
15	0456	1909	0518	1844	0539	1803	0601	1723	0629	1653	0655	1648	15
16	0456	1908	0518	1843	0540	1802	0602	1721	0630	1652	0655	1649	16
17	0457	1908	0519	1841	0541	1801	0603	1720	0631	1652	0656	1649	17
18	0458	1907	0520	1840	0541	1759	0604	1719	0632	1651	0657	1650	18
19	0458	1907	0520	1839	0542	1758	0605	1718	0633	1651	0657	1650	19
20	0459	1906	0521	1938	0543	1756	0606	1717	0634	1650	0658	1650	20
21	0500	1905	0522	1837	0544	1755	0606	1715	0635	1650	0658	1651	21
22	0500	1905	0523	1835	0544	1754	0607	1714	0636	1649	0659	1651	22
23	0501	1904	0523	1834	0545	1752	0608	1713	0637	1649	0659	1652	23
24	0502	1904	0524	1833	0546	1751	0609	1712	0637	1649	0700	1653	24
25	0502	1903	0525	1832	0546	1749	0610	1711	0638	1648	0700	1653	25
26	0503	1902	0525	1830	0547	1748	0611	1710	0639	1648	0700	1654	26
27	0504	1902	0526	1829	0548	1747	0611	1709	0640	1648	0701	1654	27
28	0504	1901	0527	1828	0549	1745	0612	1708	0641	1647	0701	1655	28
29	0505	1900	0528	1827	0549	1744	0613	1707	0642	1647	0702	1656	29
30	0506	1859	0528	1825	0550	1742	0614	1706	0643	1647	0702	1656	30
31	0507	1858	0529	1824			0615	1705			0702	1657	31
	Average Twilight Civil: 29 min Nautical: 63 min		Average Twilight Civil: 26 min Nautical: 58 min		Average Twilight Civil: 25 min Nautical: 55 min		Average Twilight Civil: 25 min Nautical: 54 min		Average Twilight Civil: 27 min Nautical: 57 min		Average Twilight Civil: 28 min Nautical: 59 min		

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1   Naval Air Warfare Center Headquarters, 1421 Jefferson Davis Highway, Arlington, VA 22243-6000
          NAWC L03
1   Commander Third Fleet, Staff Oceanographer, FPO AP 96601-6001
          (N7M)
4   Naval Facility Engineering Service Center, 560 Center Drive, Port Hueneme, CA 93043-4328
          ESC 61 (C. Matthews)
          ESC 122 (Technical Info Center)
          ESC 421 (E. Durlak) (2)
1   Naval Oceanography Command Facility, Naval Air Station, North Island,
          San Diego, CA 92135-5130
1   Commanding General, I Marine Expeditionary Force, Box 55300,
          Camp Pendelton, CA 92055-5300
          G7
1   Weather Service Office, HQ and HQ Squadron WX, Box 555151,
          Camp Pendelton, CA 92055-5151
1   Naval Western Oceanography Center, Box 113, Pearl Harbor, HI 96860-5050
1   Detachment 30, 6th Weather Wing, Vandenberg AFB, CA 93437
1   Antarctic Development Squadron SIX, Point Mugu, CA 93042-5014
1   Naval Air Reserve, Point Mugu, CA 93042-5018
1   National Weather Service, Weather Service Forecast Office, 520 North Elevar Street,
          Oxnard, CA 93030
1   USDA Soil Conservation Service, P.O. Box 260, 3380 Somis Road, Somis, CA 93066
1   Ventura College, Biology Department, 4667 Telegraph Road, Ventura, CA 93003
          Mr. Thor Willsrud
3   County of Ventura, 800 South Victoria Avenue, Ventura, CA 93009
          Flood Control District
          Public Works Agency
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1   Camarillo Star, 1000 Avenida Acaso, Camarillo, CA 93010
1   Dr. Victor Bobrow, OD, 461 West Fifth Street, Oxnard, CA 93030

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2	NAWCWPNS Code 000000D (RAdm D. McKinney) Code 00A000E (CAPT J. Dodd)	2	Engineering Division Code 833320E (S. Cervantes)
2	HARPOON/SLAM Program Office Code 4KL000E (CDR M. Sarigul-Klijn)	3	Facilities Management Engineering Division Code 833430E (H. Qualls)
1	Archive Library Code 474540E	10	San Nicolas Island Department Code 839000E (LCDR A. Eglen)
1	Test & Evaluation Code 500000E (Mr. G. Wrout)		
7	Pacific Ranges and Facilities Department Code 520000D (D. Bullard) (5) Code 521800E (LT E. Carlson) (2)		
100	Geophysics Analysis Code 521420E (C. Fisk)		
10	Surface Craft Code 521210E (LT Delgo)		
1	Test Operations Division Code 521000E (W. Leslie)		
3	Metric and TSPI System Design Branch Code 522K00E		
1	Data Processing Division Code 525220E (M. Burdullis)		
1	Threat/Target Systems Department Code 530000E (S. Mendonca)		
2	Target Operations Division Code 532310E (J. Castro)		
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2	Aircraft Maintenance Department Code 562000E (LCDR D. Laird)		
7	Information Security Operations Department Code 741100E (W. Jenkins) (4) Code 744B00E (M. Flores) (3		
1	Naval Air Weapons Station Code 830000E (CAPT S. Beal)		
1	Air Operations Officer Code 835000E (LCDR B. Cathey)		
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1	Air Traffic Control Facility Code 835300E		
14	Environmental Division Code 833200E (R. Dow) (2) Code 833220E (T. Keeney) (12)		